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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|-------------------------|
| 10/635,100 | 08/06/2003 | Akira Ishibashi | 075834.00432 | 6940 |
| 33448 | 7590 | 03/23/2005 | | EXAMINER |
| ROBERT J. DEPKE LEWIS T. STEADMAN HOLLAND & KNIGHT LLC 131 SOUTH DEARBORN 30TH FLOOR CHICAGO, IL 60603 | | | KIM, JOANNE H | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2883 | |
| | | | | DATE MAILED: 03/23/2005 |

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/635,100 | ISHIBASHI ET AL.  | |
| | Examiner | Art Unit | |
| | Joanne H. Kim | 2883 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 03 January 2005.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-75 is/are pending in the application.
 4a) Of the above claim(s) 67-75 is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-66 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 06 August 2003 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Claims 67-75 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected group, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on January 03, 2005.

Claim Objections

2. Claims 38 and 39 are objected to because of the following informalities:
 - in claim 38, line 1, "26" should be "claim 26"; and
 - in claim 39, line 1, "36" should be "claim 36" and
 - line 2, "said oxide" lacks antecedent basis.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-2, 22-27, 33-35, 47, and 65 are rejected under 35 U.S.C. 102(e) as being anticipated by Mastro et al. (U.S. Patent No. 6,710,328, hereinafter "Mastro").
5. Regarding claims 1-2, 22, 26-27, and 33, Mastro discloses an optical waveguide comprising: an optical waveguide body; and a stress-luminescent element provided in at least part of the optical waveguide body; wherein said stress-luminescent element is made from a stress-luminescent material, and light emitted from the stress-luminescent element provided on a side surface of the optical waveguide body is waveguided in the optical waveguide body (Fig. 7; and column 8, lines 23-36). Further, Mastro discloses the luminescent material that emits luminescence when pressure is applied (i.e., a finger is touched to the luminescent material).
6. Regarding claims 23-25, 34-36, 47, and 65, Mastro discloses that fiber optic measurement (using stress-luminescent material) of strain, pressure, vibration and acoustic fields (such as sound waves, ultrasonic waves) have all been demonstrated (column 4, lines 27-34) and the stress-luminescent material is crystalline (column 1, lines 52-54)
7. Claims 3-13, 16-17, and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Kleinerman (U.S. Patent No. 5,991,479).
8. Regarding claims 3 and 28, Kleinerman discloses an optical waveguide comprising: an optical waveguide body; and a stress-luminescent element provided in at least part of the optical waveguide body; wherein said stress-luminescent element is made from a stress-luminescent material, light emitted from the stress-luminescent

element provided on a side surface of the optical waveguide body is waveguided in the optical waveguide body, and the optical waveguide comprises an optical fiber, and said stress-luminescent material is provided in a clad of said optical fiber (column 8, lines 39-43; and column 37, lines 49-55).

9. Regarding claims 4-13 and 16-17, Kleinerman discloses an optical waveguide apparatus, an optomechanical apparatus, a detecting apparatus, an information processing apparatus, an input apparatus, and a fiber structure comprising: a first optical waveguide and a second optical waveguide to each other at said intersection portion, said first optical waveguide and said second optical waveguide being provided in at least part of said optical waveguide apparatus; wherein said intersection portion has a stress-luminescent material and a light receiving device (PD) is connected to an end face of at least one of said first optical waveguide and said second waveguide (Fig. 19A, column 37, lines 49-58).

10. Claim 14 is rejected under 35 U.S.C. 102(b) as being anticipated by Kiryuschev et al. (U.S. Patent No. 5,962,967, hereinafter "Kiryuschev").

Kiryuschev discloses a key-input apparatus comprising: a plurality of first optical waveguides and a plurality of second optical waveguide disposed so as to intersect each other and coupled to each to other at said intersection portions; wherein each of said intersection portions has a stress-luminescent material (Figs .1 and 2).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kiryuschev.

Kiryuschev discloses the plurality of first and second waveguides intersecting each other.

Kiryuschev does not disclose that a light receiving device is connected to one end face of each of said plurality of first optical waveguides and one end face of each of said plurality of second optical waveguides.

It is well known that a light receiving device such as a photodetector is connected to one end face of an optical waveguide for detecting the luminous intensity of the stress luminescent material.

It would have been obvious to modify Kiryuschev so that the light receiving device is connected to one end face of each of the plurality of the first optical waveguides the second optical waveguides in order to detect the luminous intensity from the each of the plurality of the first and second optical waveguides.

13. Claims 18-19 and 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mastro in view of Akiyama (U.S. Patent No. 6,159,394).

Mastro as discussed in paragraph 4 above discloses the optical waveguide comprising the stress-luminescent material.

Mastro does not specifically disclose the relationship between luminous intensity change of the stress-luminescent material and a time rate change of stress.

Akiyama discloses that luminescence emission and luminous intensity change of said stress-luminescent material are depend on a time rate change of stress (paragraphs [0011] and [0012]).

14. Claims 20-21, 31-32, 37-39, 41-42, 44, 46, 49-52, 53, 55-58, 62, and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mastro in view of Xu et al. (U.S. Patent Pub. No. 2001/0017059, hereinafter "Xu").

15. Regarding claims 20-21 and 31-32, Mastro as discussed in paragraph 4 above discloses the optical waveguide comprising the stress-luminescent material.

Mastro does not specifically disclose the relationship between a luminous intensity change of the stress-luminescent material and a speed of applying and releasing an external force to the material.

Xu discloses that the stress-luminescence and a luminous intensity change of said stress-luminescent material are depend on a speed of applying an external force to said material or a speed of releasing the external force (paragraph [0071]).

16. Regarding claims 37-39, 41-42, 44, 56-58, and 62, Mastro does not specifically disclose the composition of the stress-luminescent material (or fluorescent material).

Xu discloses that a stress luminescent material may comprise an oxide of an alkali earth metal and aluminum, the oxide being doped with only one kind of rare earth element (Eu) and has a composition of SrAl₂O₄:Eu. Xu also discloses that the stress-luminescent element has a sheet-like shape having a thickness of 0.01mm (i.e., 1mm or less).

17. Regarding claims 46, 49-52, and 64, Mastro as discussed in paragraph 4 above discloses the optical waveguide comprising the stress-luminescent material.

Mastro does not specifically disclose that the stress-luminescent material is a composite material of a fluorescent material and an elastic material and the content of the fluorescent material is in a range of 30 wt% or more and less than 100wt%.

Xu discloses that the stress-luminescent material is in the form of fine particles each having a diameter of 100mm or less (paragraph [0067]). Xu also discloses that the stress-luminescent material is a composite material of a fluorescent material and an organic elastic material and the content of the fluorescent material is in a range of 30 wt% or more and less than 100wt% (paragraph [0059]).

18. Regarding claim 54, Mastro discloses that the elastic material is polyester (column 5, lines 17-25).

19. Regarding claims 53 and 55, Mastro as discussed in paragraph 4 above discloses the optical waveguide comprising the stress-luminescent material.

Mastro does not specifically disclose that the elastic material is inorganic glass having a Young's modulus of 10 MPa or more.

Xu discloses that the elastic material is inorganic glass (paragraph [0081]). Xu discloses that the stress detecting sensitivity depends on a tested body itself, a tested body having a lower hardness would produce a higher stress detecting sensitivity (paragraph [0069]).

Therefore, it would have been obvious to have high Young's modulus, such as 10 Mpa or more in order to provide a higher stress detecting sensitivity.

20. Regarding claim 60, as discussed above, Mastro discloses that the elastic material of the stress luminescent material includes polyester and Xu discloses that a stress luminescent material (i.e., fluorescent material) has a composition of SrAl₂O₄:Eu

21. Claims 40 and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mastro in view of Watanabe et al (U.S. Patent No. 6,117,574, hereinafter "Watanabe").

Mastro as discussed in paragraph 4 above discloses the optical waveguide comprising the stress-luminescent material.

Mastro does not specifically disclose that the stress-luminescent material is doped with manganese.

Watanabe discloses that manganese may be a dopant element for triboluminescent material.

It would have been obvious to one of ordinary skill in the art to dope stress-luminescent material of Mastro with the Manganese in order to improve the efficiency of triboluminescence.

22. Claims 43 and 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mastro.

Mastro as discussed in paragraph 4 above discloses the optical waveguide comprising the stress-luminescent material.

Mastro does not specifically disclose that the stress-luminescent material has a shape of sponge.

However, it would have been obvious to one of ordinary skill in the art to modify Mastro so that the stress-luminescent material has a shape of sponge or spring in order to provide flexibility.

23. Claims 45, 48, and 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mastro in view of Qiu et al. (U.S. Patent Pub. No. 2001/0054857, hereinafter "Qiu").

24. Regarding claims 45, 48 and 63, Mastro as discussed above discloses the optical waveguide comprising the stress-luminescent material containing aluminum.

Mastro does not specifically disclose that the stress-luminescent material contains silicon and that the stress-luminescent material is in the form of gel.

Qui discloses that a stress-luminescent element is formed on a silicon substrate, which has a certain degree of mechanical strength, and that the stress-luminescent material is in the form of gel (paragraph [0067]).

It would have been obvious to one of ordinary skill in the art to modify Mastro to include silicon and form the stress-luminescent material in the form of gel to provide a certain degree of mechanical strength.

25. Claim 66 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mastro in view of Xu as applied to claim 50 above, and further in view of Qui.

The combination of Mastro and Xu discloses that the fluorescent material is crystalline.

The combination does not disclose that the elastic material is amorphous.

Qui discloses that the amorphous elastic material allows change the color of the emitted light.

It would have been obvious to modify the combination to include the amorphous elastic material so that the color of the emitted light can be changed.

Conclusion

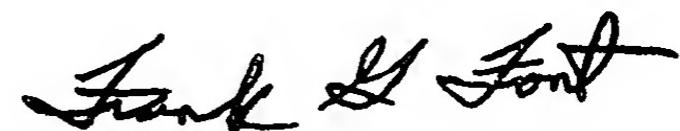
26. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joanne H. Kim whose telephone number is (571) 272-2139. The examiner can normally be reached on 8:30 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Joanne H. Kim
Examiner
Art Unit 2883

jhk/FGF



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